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throughout, collecting by the way many plants of interest to those less familiar with the central Indiana flora.

The officers of the club for the next year are: President, Wm. M. Canby; Vice-President, L. M. Underwood; Secretary, B. T. Gallo-way.

Taken all in all, the botanists of the country have no need of feeling ashamed of the quality of the work done in the association and the related societies.—CHARLES E. BESSEY.

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## ZOOLOGY.

**Heliotropism in Animals.**—Groom and Loob<sup>1</sup> think that the daily migrations of pelagic marine animals are to be regarded as caused by heliotropism. In the day-time this is negative, the strong light driving them from the surface; while at night it exercises a positive action, causing them to seek the surface waters. Their observations show that light, and not heat, is the exciting cause. Driesch finds<sup>2</sup> that heliotropism influences the growth of the hydroid *Sertulariella*.

**Excretory Organs of Protozoa.**—A. B. Griffiths states<sup>3</sup> that he has proved the existence of uric acid in the contractile vacuoles of *Amœba*, *Vorticella*, and *Paramecium*. The *Amœba* was killed under the cover-glass with weak alcohol. This was followed by nitric acid, the slide warmed, and then ammonia was drawn under the cover-glass, the result being the formation of crystals of murexide in the contractile vacuole itself, as well as in its excretion. This clearly shows that these organs are for the excretion of nitrogenous waste.

**Note on Some Gigantic Specimens of *Actinosphærium eichhornii*.**—In a small pond near the observatory of the State University of Iowa I collected some material which now stands on a table in the laboratory. Minute whitish discs, plainly visible, however, to the unaided eye, may be seen in considerable numbers clinging to the stems and leaves of *Ceratophyllum*. An examination of these discs reveals the fact that they are gigantic Rhizopods belonging to the genus *Actinosphærium*. *Actinosphærium eichhornii* they probably are, but they are vastly larger than any individuals of this species usually

<sup>1</sup> *Biol. Centralblatt.*, X., 160 and 219.

<sup>2</sup> *Zoolog. Jahrbuch.*, V., p. 147.

<sup>3</sup> *Proc. Roy. Soc. Edinburgh*, XVI., p. 131.

seen, and larger than any recorded by Prof. Leidy in his work on the "Fresh-Water Rhizopods of North America." The first specimen I measured, in place of being 0.4 mm., the maximum diameter given by Leidy, was 0.85 mm. in diameter, with rays projecting 0.45 mm. beyond the margin of the body. There are scores of individuals in my jar, and the average diameter is in excess of 0.75 mm. The largest specimen measured had a diameter of 1.36 mm., and there are not a few individuals that seem to be equally as large.

It is worthy of record that a large proportion of the specimens that passed under the microscope had been feeding on small specimens of Cyclops. Rotifers seems to be a favorite article of diet with Actinosphærium, and even the individuals that had succeeded in capturing Cyclops contained often three or four Rotifers. Diffugia was taken by a few, but none, so far as observed, had condescended to feed on diatoms or other forms of algæ. It has been a matter of surprise that a creature so sluggish as Actinosphærium should be able to capture Cyclops. How the capture is made I have thus far not been able to determine.—S. CALVIN, *Biological Laboratory, State University of Iowa, September 20, 1890.*

**Portuguese Man-of-War.**—Mr. Robert P. Bigelow studied<sup>4</sup> the habits of the Portuguese man-of-war (which has lost its familiar name *Physalia arethusa*, and has been rechristened *Caravella maxima* in Haeckel's recent monograph). This form feeds largely on small fish; these, swimming against the tentacles, are caught and benumbed; but apparently their struggles pull the tentacle, which contracts, bringing the prey up to the numerous feeding-bells. If the fish does not struggle the tentacle fails to contract. The feeding-bells spread themselves over the fish and digest it. During the summer of 1889 these splendid siphonophores were very abundant at Woods Holl, Mass., but during the summer of 1890 not a single individual was seen.

**Dimorphism in Antipatharia.**—G. Brook describes<sup>5</sup> an interesting type of dimorphism in the Antipathidæ. In Schizopathes, Bathypathes, etc., the zooids have become elongated in the transverse axis, so that the six tentacles appear like three pairs. Corresponding with this there is a depression between the oral and lateral regions, so that from the surface each zooid appears like three lobes, each with a pair of tentacles. Internally the lateral portions are separated from the central by a mesogloæal partition, and since the lateral mesenteries

<sup>4</sup> Johns Hopkins Univ. Circ., IX., p. 61. 1890.

<sup>5</sup> Proc. Roy. Soc. Edinburgh, XVI., p. 78.

alone bear reproductive organs, and only on their distal portion, the result is that the division produces from each primitive zooid a gasterozoid flanked by two gonozoids. It is hardly necessary to say that this dimorphism is different from that in the Hydrozoa.

**Acanthocephali.**—The systematic position of the Acanthocephali has long been a problem, although from similarity of shape they were usually placed near the Nematodes, or round worms. Recently Dr. Hamann has been studying the subject, and finds<sup>6</sup> additional grounds in support of this view. He thinks that the water vascular system is homologous in each, while he recognizes the problematical acanthocephalan lemnisci in cervical or cephalic glands occurring in many Nematodes.

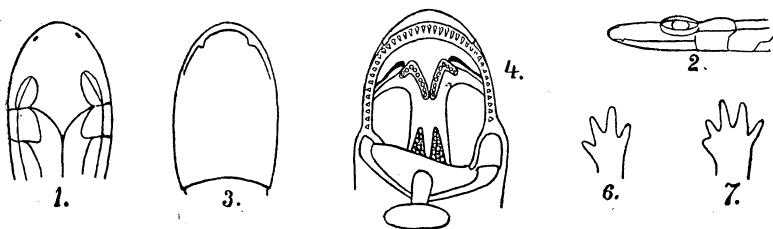
**On a New Species of Salamander from Indiana.**—At the time of the meeting of the American Association for the Advancement of Science of the present year, at Indianapolis, Mr. A. W. Butler, of Brookville, Indiana, presented me with three specimens of a species of Salamander which were taken in a spring near to Brookville. Two of these were living, while the third is an alcoholic specimen from a collection which embraces a number of other individuals from the same locality, belonging to Mr. Butler.

The three specimens represent young, middle-aged, and mature individuals, which have passed their metamorphosis. They agree nearly in their characters. They belong to a species which resembles the *Spelerpes longicaudus*, but are distinct in form, color, and habits, and belong, moreover, to the genus *Gyrinophilus*. The premaxillary bones are of feeble structure, and the spines are distinct and widely separated, contrary to the structure in the genus *Spelerpes*. The mature individuals, of which Mr. Butler possesses several, are much more robust than those of *S. longicaudus*, having a short body and relatively long preaxillary region and head. With this the tail is as long as in the *S. longicaudus*, and is similarly compressed. The entire animal is larger. The color is different from that of the *S. longicaudus*. It is vermilion-red, as in *S. ruber*, and the superior surfaces of the head and body are irregularly spotted with dark brown. The sides of the tail are similarly irregularly brown-spotted, the spots not showing the least tendency to form the vertical bars characteristic of the *S. longicaudus*. The form of the series of vomerine teeth is different. Instead of commencing at the posterior border of the internal nares, they commence opposite to the anterior border of the same, and

<sup>6</sup> *Zoolog. Anzeiger*, XIII., p. 210. 1890.

send posteriorly a short branch along the internal border of the choana, thus giving a hook-shaped outline to each series. The proportions are as follows :

Width of head five times in length of head and body. Length of head to axilla two and a third times into total length of head and body to groin. Tail one and a-half times the length of the head and body. When the limbs are extended, the posterior toes reach the distal extremities of the metacarpals. Thirteen costal folds. The width of the head is half the length to above the middle of the humerus. The canthus rostralis is distinct, though not so strongly marked as in *Gyrinophilus porphyriticus*. Total length, 152 mm. ; length to angle of mouth, 8 mm. ; to axilla, 23 mm. ; to groin, 53 mm. ; to extremity of vent, 62 mm.



*Gyrinophilus maculicaudus* Cope;  $\frac{2}{3}$  natural size. Fig. 1, head, from above; Fig. 2, head, from below; Fig. 3, head, profile; Fig. 4, interior of mouth,  $\frac{2}{3}$  natural size; Fig. 5, fore foot, from below; Fig. 6, hind foot.

In the adult specimens the subnareal processes are quite prominent. In young specimens the ground-color is yellower than in those of medium and full size.

I propose to call this species *Gyrinophilus maculicaudus*. In its habitat in cold springs it resembles *Spelerpes ruber*, with which it agrees also in color. The *S. longicaudus* is a terrestrial species.

The first specimens of *G. maculicaudus* were found by Mr. E. R. Quick, of Brookville, Indiana.—E. D. COPE.

**An Apparently New Species of Chelys.**—Only one species of Chelys has been known so far, the well-known fimbriated or bearded turtle, *Chelys fimbriata* Schneid. from South America.

The osteological department of Clark University received lately from Ward's Natural Science Establishment, among other reptiles, a specimen of Chelys in alcohol. The label gave the locality Orinoco. When I examined the animal I found considerable differences from the description and figures given in Boulenger's catalogue.

Boulenger gives as one of the *generic* characters of *Chelys*; "jaws In the specimen before me (length of shell over curve, 430 mm. ; breadth over curve, 376 mm.) there is a very well-developed horny beak, not different in structure from that of other Chelonians. The structure of the skull also showed considerable differences with that figured by Boulenger. In Boulenger's figure the plates end in a sharp angle behind ; this region is quite different in my specimen, and agrees exactly with the figure given by Cuvier (Ossem. foss.). But the greatest difference is to be seen in the lower face of the maxillary. In Boulenger's specimen the lower alveolar face of the maxillary at the middle is not broader than the vomer, forming about one-sixth of the breadth of the palate. My specimen agrees with Cuvier's figure ; the alveolar surface is considerably broader than the vomer, and forms less than one-quarter of the breadth of the palate. The figure given by Hoffmann is like that of Cuvier. I do not know how the figures presented by Wagler and Bruehl compare with that of Boulenger, having the works of these authors not at hand. It is hardly possible that the figure published by Boulenger is incorrect, since all the other new figures in the catalogue are accurate. I can only think that there are two different species of *Chelys*. The common *Chelys fimbriata*, figured by Cuvier and Hoffman, and agreeing with my specimen, with well-developed horny beak, and an other one figured by Boulenger as *Chelys fimbriata*, which would represent a new species, which may be called, if future examination proves its distinctness, *Chelys boulengerii*.—G. BAUR, *Clark University, Worcester, Mass., Oct. 30th, 1890.*

**Snakes in Banana Bunches.**—EDITORS AMERICAN NATURALIST: Referring to the item "Snakes in Banana Bunches," in the AMERICAN NATURALIST for August, 1890, I wish to say that nearly two years ago I obtained a snake, brought to this city in a bunch of bananas. It being in winter the snake was still alive, though lethargic, and which I identified as a young *Boa imperator*. It is about three feet in length, and is now in the museum of this Society.—J. A. HENSHALL, *Secretary and Director Cincinnati Soc. Nat. Hist., Cincinnati, September 8, 1890.*

NOTE BY EDITOR.—Since our item above referred to, two cases of the *Boa imperator* having been found in banana bunches, in Philadelphia, have come under my notice. It is a coincidence that since the banana is believed by some to have been the "forbidden fruit" of the Garden of Eden, serpents should be so readily concealed in its fruit.—E. D. COPE.

**The Brain-Weight of Birds.**—In preceding pages of the AMERICAN NATURALIST (see Vol. XXI., p. 389, and Vol. XXII., pp. 537-539) I have given my results attained by an investigation into the relative weight of the brain to the body in birds. As an addition to the ones already given I have made the following new relative weights:

Name of Bird.	Weight of Body.	Weight of Brain.	Sex.	Relative Weight of Brain to Body.	Date Specimen was taken.
<i>Spizella monticola.</i>	299	12¾	♂	1-23	Mar. 15, 1889.
<i>Junco hyemalis.</i>	310	12¾	♂	1-25	" "
" "	282½	11¾	♂	1-24	" "
<i>Melospiza fasciata.</i>	343	14	♂	1-25	" "
<i>Troglodytes hiemalis.</i>	145	9	♂	1-16	" "
<i>Parus atricapillus.</i>	184	11	♀	1-17	Mar. 23, 1890.
<i>Sialia sialis.</i>	628	15	♂	1-42	" "

The above weights are given in grains, and the specimens were taken at Chicago, Ill.—DR. JOSEPH L. HANCOCK.

**Zoological News.—Vertebrata.**—Sir William Turner has had an opportunity to study the placentation of dugong. He finds,<sup>7</sup> contrary to Harting, that the placenta is zonary, and probably is non-deciduate. His material was older than that of Harting.

J. S. Kellogg has studied the development of the primitive kidney of Amblystoma. In his preliminary paper<sup>8</sup> he finds that the pronephric duct is first to be formed, and, contrary to what has been described in other vertebrates, this arises not from the ectoderm, but from the somatic portion of the mesoderm. The tube is cut off from the rest of the coelomic epithelium except at two points, where the connection persists as the nephrotomes. With growth the funnels and their ducts become greatly convoluted.

<sup>7</sup> Proc. Roy. Socy. Edinburgh, XVI., p. 262.

<sup>8</sup> Johns Hopkins Univ. Circ., IX., p. 59. 1890.